BIM REALITY CHECK-UP & WHAT'S AHEAD

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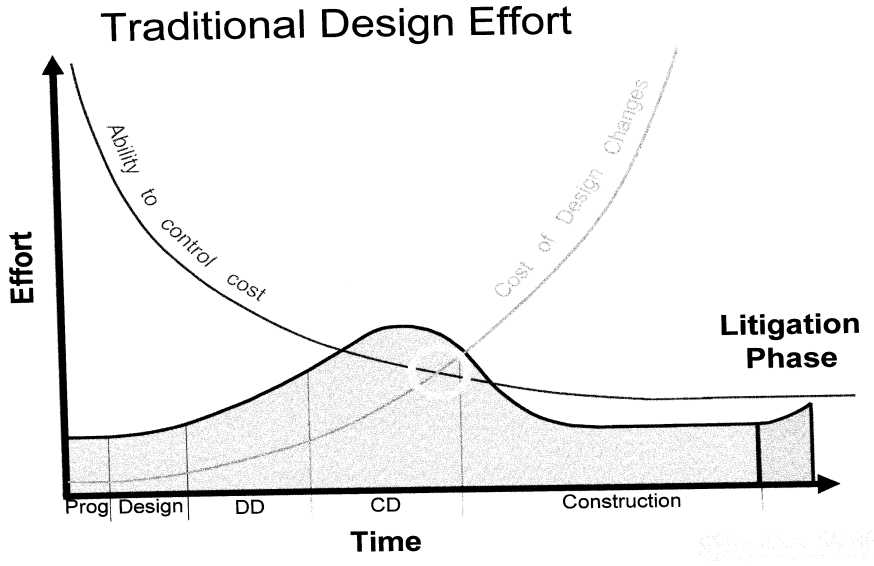
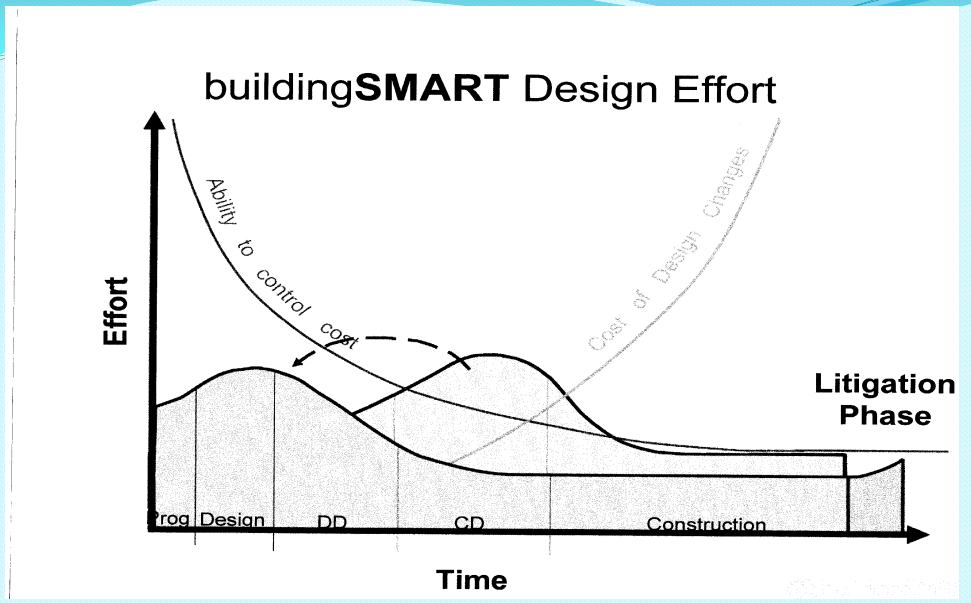
BIM ISSUES MIRROR THE CONSTRUCTION INDUSTRY

When we solve the fundamental issues regarding Procurement in the Construction Industry, BIM issues can similarly be addressed

WHAT IS THE FUNDAMENTAL ISSUE OF PROCUREMENT IN THE CONSTRUCTION INDUSTRY?

- It is the information "disconnect" between Design & Procurement and the Supply Chain
- The Supply Chain means Main Contractors, Sub-contractors, Specialist Contractors, Suppliers & Manufacturers
- If we solve this "disconnect," we will likely solve the issues in BIM implementation.
- Therefore, BIM must extend all the way to the Supply Chain.





DESIGN & PROCUREMENT TEAM SHOULD UNDERSTAND SUPPLY CHAIN PEOPLE

What do Supply Chain people manage?

1. **Risks**

- performance, scheduling, financial, technical, etc.

2. **Value**

- cost efficiencies, value-adding

3. **Relationships (trust)**

- communications & information-flow
- conflicts

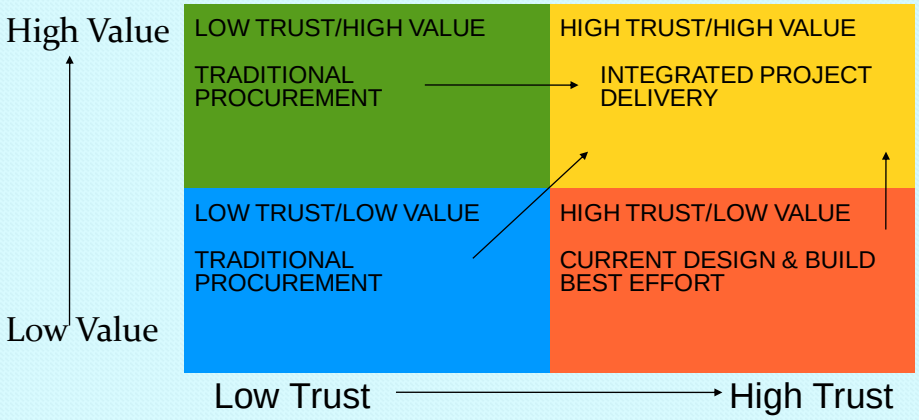
BENEFITS OF INVOLVING THE SUPPLY CHAIN EARLY IN THE BIM CHAIN

- Early integration of Design & Procurement with the Supply Chain will result in High Trust level.
- When **Trust** is **UP**, **Risks** go **DOWN** and **Value Add** goes **UP**
- ***But*** *traditional Design & Procurement does* ***not*** *cater for managing* ***Risk*** *and* ***Trust*** *further down the Supply Chain*

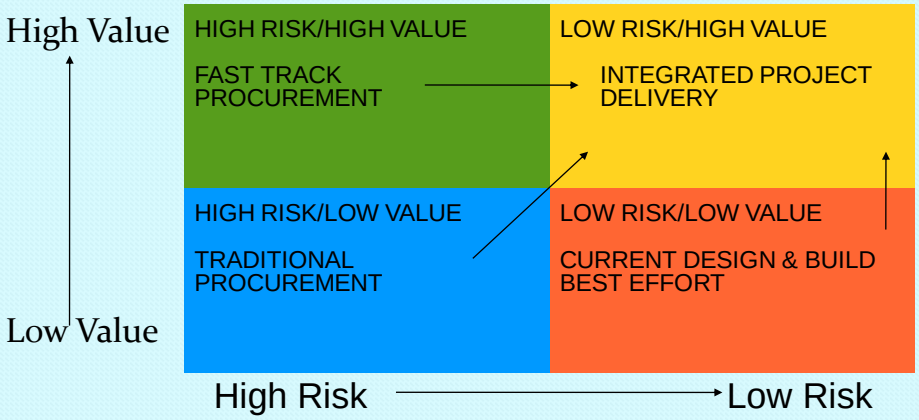
TRADITIONAL SUPPLY CHAIN VS. DESIGN & PROCUREMENT MANAGEMENT

SUPPLY CHAIN	DESIGN & PROCUREMENT
Manages	**Manages**
Value (for Contractor)	Value (for Client)
Risks	Design (aesthetics, buildability)
Relationships (Trust)	Information for procurement
	???
	???

TRUST-VALUE ADD QUADRANT



RISK-VALUE ADD QUADRANT



IPD VALUE CHAIN

- **Trust**, **Risk Mitigation**, **Value Enhancement** can be achieved by Integrating the Supply Chain into the Design & Procurement process
- BIM is the enabling tool for Integrated Project Delivery
- PIM is the tool for managing BIM

BUT HOLD ON ...

There are real issues even in S'pore & HK that have **not** been resolved completely:

- **IP issues** wrt to object libraries and building elements – proprietory, open-source, hybrid (what to filter)
- **Standardizing the information** exchange – how much to give? LOD 1 to 5, Clients must be aware
- **Coding** of BIM (labelling & tagging) for **SMM & BQ** will be complex & tedious
- **Coding** of BIM for **Estimating** is also challenging
- **Contractor's Cost Codes** and Finance Department's **Chart of Accounts** may differ in an ERP management system

LEVEL OF DETAIL RELATIONSHIP TO SUPPLY CHAIN

LEVEL OF DETAIL	DESIGN PROFESSIONAL	QUANTITY PROFESSIONAL	SUPPLY CHAIN PROFESSIONAL
LOD 1	Concept design (massing)	Rule of thumb guestimating	
LOD 2	Concept design (GFA, surface areas, volume)	Approximate estimating	
LOD 3	Schematic design (openings and structural layout)	Preparation of detailed cost plan	Sufficient for D&B Cr. to develop further detailing
LOD 4	Detailed design development for tendering	Preparation of Bill of Quantities	Contractor's procurement, fixing details, connections
LOD 5			Info. required by manufacturer, etc.; As-Built Drawing for FM

TRADITIONAL LOD INADEQUATE FOR SUPPLY CHAIN?

Major consequences:

- Client & Design-Procurement Team do not focus comprehensively on Risk factors that may seriously impact the project
- Design-Procurement Team may not be aware of gaps in information – e.g., LOD 4 may be non-existent in certain parts of the design work leading to VOs, etc.
- Traditional Design-Procurement does not consider LOD requirements for manufacturing & assembly for complex surfaces, components & parts

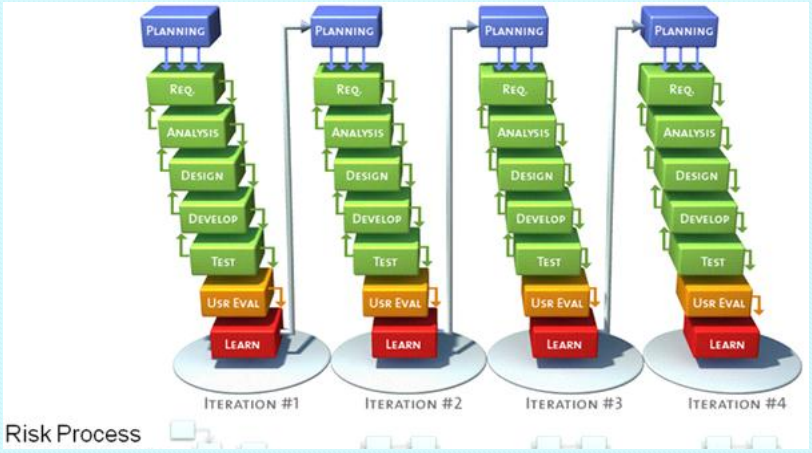
RISK MITIGATION IN THE BIM CHAIN

Consider Supply Chain early involvement to mitigate risks, especially for D&B projects, even before LOD 3 is complete

RISK MITIGATION WILL SAVE CONSTRUCTION COSTS

- It makes sense to consider risk mitigation early in design stage;
- Is the curent level of information available reliable or sufficient to avoid risks (in design & construction) and unacceptable variances?

RISK MITIGATION DURING PRE-BIM & BIM



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WHICH STAGE ARE WE IN NOW IN TERMS OF TEAMING FOR BIM?

STAGE 4
PERFORMING

STAGE 3
NORMING

STAGE 2
STORMING

STAGE 1
FORMING

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STAGE IN INDUSTRY BIM TEAMING

- In teaming for BIM, we in Malaysia are just entering into Stage 2;
- S'pore has probably reached the tail end of Stage 3 and HK somewhere in the middle of Stage 3;
- Scandinavian countries advanced in BIM are entering into Stage 4

WHAT'S AHEAD

- After going through Stage 3, BIM adoption would have reached maturity level;
- At Stage 4, Transactional BIM and Information Take-Off as opposed to Quantity Take-off would become reality;
- Using Work Flow language, the Design & Quantity Professional would design the processes to transact information embedded in BIM

CONCLUSION

There is more to Life than increasing its speed
- Mahatma Gandhi

BIM is not just about being faster. It integrates design & procurement with the supply chain by enhancing value, reducing risks and promoting trust to deliver projects.

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Appendix A

INDUSTRY LEVEL ISSUES	MINUSES	PLUSES
1.BIM Roadmap	Still no clear BIM Roadmap that is being championed, owned and embraced by all industry players	CIDB is currently drafting a BIM Roadmap (this will require buy-in)
2.Regulations supporting BIM	E-submissions not mandatory in public & private sectors; buildability/ constructability scores that would encourage BIM usage are absent	
3.Intra Industry Collaboration	More concerted effort required for genuine collaboration – integrating design & procurement; and design & procurement with supply chain	Building Industry Presidents' Council has set up a BIM Steering Committee – policies and activities need formulation
4.Industry-Academic BIM collaboration	Minimal	RISM QS Division Technical Committee has Researchers from academia
5.Incentives	No government policy yet to subsidize purchase of BIM software unlike in Singapore. Cost of BIM software is high and so are training costs	CIDB provides subsidized training for a BIM software in collaboration with a vendor. PAM currently offers BIM software training course
6.Standards	No 2D CAD drawing standards nor standards for 3D BIM such as common library for building elements; IFC not widely used; no BIM SMM	RISM QS Division Technical Committee looking into BIM SMM. On-going dialogue with JKR BIM Team to collaborate on BIM for QS applications

Appendix A

INDUSTRY LEVEL ISSUES	MINUSES	PLUSES
7.Implementation Issues	Challenging to apply BIM to entire Supply Chain; Still unsure of the BIM managing role and requirement to prepare BIM Specifications; Standards for interoperability not clear; Specialist contractors do not want to spend too much time managing BIM	
8.Transactional BIM	Still unheard of	Information from BIM model and e.g., agcXML can be used to process stage payments, etc. Good potential for Quantity Professionals here
9.Workflow Management programming for transactional models	Still unheard of	Workflow management programming will create new knowledge and processes beyond 3D for 4D, 5D, 6D, 7D, etc.
10.Managing BIM documents & communication flows in the Cloud	Few have implemented it	Potential to expand beyond traditional roles to knowledge management, digital forensics, etc.

Appendix A

INDUSTRY LEVEL ISSUES	MINUSES	PLUSES
11.BIM competency certification	Non-existent	BIM Coordinator and BIM Manager certifications need to be launched for industry. RISM looking at starting with a BIM Coordinator certification course first
12.Common BIM curriculum for students in higher institutions of learning	Non-existent	RISM QS Division will collaborate with QSAC/BQSM and training provider to formulate a common ICT curriculum for higher institutions of learning offering quantity surveying
13.Civil BIM, Green BIM, Carbon BIM, etc.	Non-existent	Coming soon. Potential collaborators identified or being identified
14.2D to BIM conversion	Will the client pay? - still uncertain	QS can use software to convert 2D to 3D for automated QTO without going through standard BIM processes

THANK YOU!